Guideline: NASA's Technology Transfer Process
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Based on the Innovative Partnerships Program (IPP) Office's Technology Transfer Overview Course, the AETD's Mini-course #61, both presented by Laura Schoppe, and interviews with Chris Lynnes and Steve Berrick; Patrick Coronado; Dale Hithon, Abdul Ibrahim, and Melissa Jackson.

1   Background on Technology Transfer

NASA policy and U.S. law makes technology transfer a top-down commitment for the Agency. NASA is involved with both spin-out, finding new applications for NASA innovations, and spin-in, where innovations by others outside of NASA are used to help solve NASA problems. The technology transfer process is important because it benefits NASA in ways such as saving time, saving money, generating revenue, and freeing up funds for NASA-only work. It also benefits you, the innovator, in a variety of ways:

- Project/Program Benefits – increasing interactions with other organizations, having advocates for projects and programs
- Recognition – NASA Tech Brief articles, awards that often carry monetary prizes
- Financial Awards from NASA – both automatic (e.g., patent application) and applied
- Royalties – from licensing patented technologies (innovators are paid first)

Without proper technology transfer, royalties are lost, awards are lost, and recognition and credit are lost. Therefore, it is crucial to complete technology transfers through the established process in order to provide the maximum benefits to all involved (innovators, Center, and NASA).

2   New Technology Reports (NTRs)

The success of the technology transfer process relies on the reporting of new technologies by their inventors. **Reporting new technologies and innovations is required**, for both civil servants and contractors (through their contracts). This is often not done, either because people are not aware that it is required, or because they think it will stop their progress, which is not the intention of the process. Once innovations have been reported, the IPP Office takes care of most of the business-end work for you. The IPP Office will evaluate NASA's technologies and needs, find licensees and partners, negotiate agreements, and publicize successes.

Filing NTRs is required, and allows the IPP Office and its colleagues to determine ownership of the technology, decide whether to pursue active technology transfer, and file patent applications before public disclosure/publication to protect NASA's rights. NTRs are also required in order to be eligible for awards. A report should be filed as soon as you recognize that you have a new invention. This can be done very early and the invention developed afterwards, but it is best to have more than just an idea to report. The NTR should be filed before public disclosure or publication of the technology, because once that happens there is a

deadline of one year to protect the disclosed technology. This deadline can be missed if you're not careful or if the IPP Office does not know about the technology because no NTR was filed. Waiting too long to file NTRs is a common mistake. It is typically easier to submit NTRs earlier rather than later since there is less history behind the technology, which makes it easier to collect the necessary information and signatures, while people are still around and involved in the project.

NTRs can be filed electronically through http://entre.nasa.gov/, NASA's eNTRe system. This is the electronic equivalent of filing NASA Form 1679. The type of information needed for the report includes:

- The innovators and some information about them
- The motivation for developing the idea or problem solution
- A technically complete, easy-to-understand description of the innovation
- Any unique or novel features and results/benefits
- Any potential commercial applications – the IPP Office will research this, but if you can think of any, include them
- Any previous or contemplated disclosures or publications
- The development history of the innovation – laboratory notebooks with detailed records and dates will help here
- For software, some additional information is required about topics such as who beta-tested the software, if modifications will continue, is a copyright registered, has the latest version (or prior versions) been distributed outside of NASA or contractor, and does it contain code not owned by the U.S. Government or its contractors

A good guideline to follow when deciding who to list on the NTR is that people whose contributions are less than 10% are not considered innovators.

If there are major changes in the technology or software, made by the original developers or others, a new NTR needs to be submitted. New NTRs typically are not needed if you are simply modifying the technology or software to work in your system or if you are making small fixes to it.

3 Basic Spin-Out Process

The spin-out process is one of intellectual property (IP) management. The IPP Office follows the following six major steps in this process:

1. Solicit – this is typically requesting NTRs
2. Screen – triage (done monthly at GSFC by IPP) and assess the potential of the technology
3. Strategize – determining what to do with the technology, protecting it
4. Seek – finding the licensees and partners, outreach
5. Secure – negotiations to secure rights and get deals signed
6. Succeed – publicize, apply for awards, promote, and monitor

The IPP Office handles the majority of this work for you, allowing you to continue innovating. Your involvement typically only includes:

- Submitting the initial NTR promptly
- Avoiding premature disclosure of the technology
- Maintaining appropriate documentation to support NASA's IP position (e.g., lab notebooks)
- Reviewing text for Technology Opportunity Sheets (TOPS) and Web pages
- Presenting at briefings, conferences, or trade shows
- Participating in pre-negotiations teleconferences with potential partners – about the time you can commit to the partnership and what is needed for you to do so (the IPP Office handles financial concerns)
- Providing supporting as required by agreements
- Protecting IP from improper use by using appropriate agreements for dissemination

You will generally have little involvement in the negotiations (the "Secure" step), but will be consulted if terms being negotiated relate to technical assistance. In the case of successful transfers, you will be interviewed by the IPP Office to develop success stories and awards, mainly to verify information.

When contractors are involved and the contracting company chooses to pursue development, the situation is different. In some cases (the contract terms determine this), the contracting company is given the first right of refusal by NASA to either secure intellectual property (IP) protection for the technology themselves or turn the rights over to NASA and let NASA secure the IP. If they choose the former, the IPP Office will turn things over to them. If they do not pursue IP coverage within two years, NASA can pull back the title/ownership from the company and pursue IP protection. In the latter case, the IPP Office continues its usual commercialization process.

Additional information about the technology transfer spin-out process can be found in a series of Web pages starting on http://ipp.gsfc.nasa.gov/resources-ttprocess1.html.

4   Software Protection and Release

In the case of government work, software is typically covered under one or more licensing options:

- Open Source – defined to address government concerns
- Copyright – but not if developed solely by federal employees
- Patent – underlying concepts of code (algorithms) may be patentable

For commercially viable software, the IPP Office prefers not to release software as open source, since NASA loses royalty rights in these cases, but it can and has been done. The NASA Open Source Agreement (NOSA) is typically the preferred open source license, and use of other licenses may require discussion. The IPP Office also prefers patents to copyrights, since the royalties for patents go to NASA, but royalties for copyrights go to the Department of the Treasury. Patents are issued to people, and copyrights are issued to companies and/or the government. These preferences are also designed to protect the innovators, their technologies, and Goddard's strategic position. People who receive your software may end up competing against you for funding, and your rights need to be protected.

Once an NTR has been filed, a software release can be requested. If the technology has not been reported when a transfer request is made, the NTR will have to be completed first, lengthening the process. The type of release desired can be requested, but it is not always granted, and options from less to more restrictive include:

- General public release – typically not used unless NASA has lost IP coverage or chooses not to protect the IP
- Open source release
- U.S. and foreign release – typically used for IPP commercialization strategies
- General U.S. release only – typically used for IPP commercialization strategies
- U.S. government purpose release

If your software makes use of commercial off-the-shelf (COTS) or open source software, these components will need to be removed from the software before it can be released. NASA cannot authorize the release of something it does not own. In this case, providing links to where people can buy the COTS or download the open source software is a way to make sure others are aware of the dependencies of your software.

Software release is separate from reporting the software via NTRs, and it is not automatic. For software releases, the inventor requests authorization to release the software. This requires completion of an NTR, Export Control form, IT Security (Global Concerns) form, a Software Release Preliminary Questionnaire, and submission of all forms to the IPP Office (Software Release Authority). The Preliminary Questionnaire includes questions about: the development/origin of the software such as who wrote the code for whom and how it was funded; technical details such as version numbers, does it analyze network traffic, incorporation of other software, use of encryption, availability of documentation; details of previous releases including if it has been given away for free; the request for new release including who wants the software for what purposes and if you want it to be open source.

The software release request must go through Export Control to confirm the software complies with relevant laws, IT Security to determine if the software is classified and that it will not allow unauthorized access to NASA computing resources, the Patent Counsel to determine ownership of the software and identify release restrictions, and the Software Release Authority (the IPP Office) for review of the release strategy and final decision on the release level granted. You will typically be involved in a few meetings relating to the export control process in order to defend why the technology will not be used against the U.S. If there is doubt (an atypical situation), it may have to be reviewed by the Department of Commerce and/or the Department of State. This process can take about one year to complete, and progress cannot be tracked. Once Export Control has cleared the software for release, your involvement in this stage is basically done; you are typically not involved in the legal aspects, such as determining ownership and assessing patentability.

Transferring technology within NASA, from one group/project to another, falls under the last category (U.S. government purpose release), and is easily handled by Software Usage Agreements (SUAs). These are typically quick and easy, and protect the technology by only allowing it to be used on a particular project for a particular purpose. Creation of the SUA is done by the Patent Office, on-demand when a need for the technology is shown by the group wanting to use it. The SUAs are created on a case-by-case basis for the technology being

transferred, so no template can be provided. You should not create and use your own SUA; going through the IPP Office ensures that all legal concerns are handled properly and internal GSFC strategy is protected. Assuming the NTR is already in place, SUAs can be completed in as little as one day. For the other types of release, if there is an immediate need, the process can be completed in approximately 2–3 weeks.

Additional details about the software release process can be found on the IPP Office's Web site at http://ipp.gsfc.nasa.gov/SRA/.

5   References

5.1 Interviews and Classes
- Interview with Chris Lynnes and Steve Berrick, Jan. 12, 2007
- Interview with Patrick Coronado, Feb. 21, 2007
- Interview with Dale Hithon, Abdul Ibrahim, and Melissa Jackson, Apr. 26, 2007
- Technology Transfer Overview Course, offered by the IPP Office and presented by Laura Schoppe, May 15, 2007
- Applied Engineering and Technology Directorate (AETD) Mini-course #61 presented by Laura Schoppe, August 29, 2007

5.2 Policies and Laws
- National Aeronautics and Space Act of 1958 (as ammended)
- Stevenson–Wydler Technology Innovation Act of 1980 (P.L. 96-480)
- Bayh–Dole Act of 1980 (P.L. 96-517)
- Federal Technology Transfer Act of 1986 (P.L. 99-502)

5.3 Web Sites
- http://ipp.gsfc.nasa.gov/ – Goddard's Innovative Partnerships Program (IPP) Office
- http://entre.nasa.gov/ – NASA eNTRe, the Electronic New Technology Reporting site
- http://ipp.gsfc.nasa.gov/SRA/ – Software Release Information and Procedures section of Goddard's IPP Office site
- http://ipp.gsfc.nasa.gov/resources-ttprocess1.html – Technology Transfer process description and FAQ from Goddard's IPP Office site
- http://www.opensource.org/licenses/nasa1.3.php – a text version of the NASA Open Source Agreement (NOSA)